I own a small Internet Service Provider in rural Montana. We provide service to business and residential customers in mountainous terrain, using unlicensed spectrum. First I need to say that without the unlicensed bands and the availability of low-cost equipment for their use, we would not be able to provide our service. So thank you to whoever is responsible. Comments inline below:

> 29. We also seek comment on the extent to which spectrum is
>being used to provide wireless services to rural communities. We ask
>commenters to identify the service providers that are utilizing unlicensed
>spectrum and the types of service they are offering. Further, we seek

We offer IP connectivity with speeds up to 1Mbit/s. We use the 2.4, 5.2 and 5.7GHz bands.

>comment regarding actions the Commission could take to encourage or
>facilitate the use of unlicensed spectrum. For example, unlicensed

The rules relating to certification of antennas along with radios (system certification) are sometimes inconvenient for rural operations. This is because the radio vendors choose which antennas to certify. Their choices may not be ideal for remote and exposed sites. A change in the rules to allow a simple and low cost certification of additional antennas with previously certified radios would benefit those of us who must operate in these more problematic locations.

The use of unlicensed spectrum, particularly for the last path to the customer, in a point-to-multipoint configuration, is not particularly suited to the provision of a commercial service. The risk that some future interference source will render our network inoperable is a significant worry. Ideally I would prefer to use licensed spectrum for this purpose, IF that spectrum were available at a price which suits the economics of rural Internet Service. At present this is unfortunately not the case.

>operation is generally limited to very low power levels in order to help
>ensure that the operation does not interfere with licensed services.
>However the interference potential of unlicensed devices may be low or
>negligible in rural communities. Should unlicensed devices be permitted to
>use higher output levels in such environments? If so what criteria would

My concern is more with interference *between* users of the unlicensed bands.

In truly rural areas we see extremely low background noise levels. In those areas, there could be some benefit from the use of higher power. For example, in a valley which is 20 miles long, current rules would mandate the deployment of two points of presence (practical range is about 10 miles). Increased power allowing 20 mile range would halve the startup cost to provide service to such a valley.

However, any rural service must be fed from a town. We find that noise and interference problems are significant, even in small towns (10,000 population). Therefore it will be necessary to solve the spectrum crunch in town in order to get a signal out to the rural customers. So to a degree, the rural spectrum problems are in fact the same as the urban spectrum problems.

One change which I believe could be easily made would be to allow higher EIRP (same rules as the 5.7GHz band) for the 5.2GHz band in rural areas. The benefit here would be that an additional 75MHz of spectrum would be available for use. The current rules for 5.2GHz limit practical range to two miles, which is too short to be of much use in a rural setting (too few potential customers within a two mile radius).

Again I would like to draw attention to the rules on ‘system certification’ in the unlicensed bands. We see cases where radio vendors have certified antennas only up to two feet diameter. However, the existing EIRP rules would allow larger antennas and consequently longer range. But because the only markets where this long range is of much practical use are rural, and rural markets aren’t a significant proportion of the radio vendors’ business, they choose not to certify three and four foot antennas. So we have the choice between deploying an uncertified system, or building additional, unnecessary relay towers to keep path lengths within that achievable with the smaller certified antennas. A streamlined low cost process for certification of the larger antennas would be valuable for some rural operators.

>have to be met in order to qualify to use the higher power levels?"

This is tricky because the definition of rural is highly subjective. Perhaps some kind of remote sensing (space-based or airborne) could be used to survey emission levels in the affected bands. Areas with low emission levels could be designated rural.